




Structural Relationships Modeling of Neuroticism, Openness, and Mental Health with the Mediating Role of Social Support among Students

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ABSTRACT

Objective: The present study aimed to model the structural relationships between personality traits (neuroticism and openness) and mental health with the mediating role of social support among students.

Methods and Materials: The research method was fundamental in terms of purpose and correlational in terms of method, specifically using structural equation modeling. The statistical population included all students of Islamic Azad University, Sari branch, in the 2023-2024 academic year, totaling 5,400 individuals. Using Kline's method and a non-random (available) sampling method, 269 individuals were selected as the sample. After explaining the research by the investigator and obtaining the respondents' willingness to participate, the NEO Five-Factor Inventory (NEO-FFI) (McCrae & Costa, 1992), the 28-item General Health Questionnaire (GHQ-28) (Goldberg, 1972), and the Perceived Social Support Questionnaire (Zimet, 1988) were administered. For data analysis, both descriptive (dispersion index, central tendency index, mean, and standard deviation, data normalization) and inferential (structural equations) statistical methods were used.

Findings: The results showed that the two personality traits of neuroticism and openness have a direct effect on mental health. Additionally, the personality traits of openness and neuroticism have an indirect effect on mental health through the mediation of social support. Furthermore, the findings indicated that 59% of mental health can be explained by personality traits and social support in direct and indirect pathways ($R^2 = 0.59$). Specifically, the personality trait of neuroticism has a 31% direct effect on mental health, and neuroticism with the mediation of social support has a 37% indirect effect on mental health among students. The findings also showed that 12% of mental health can be explained by the variables of neuroticism and social support in direct and indirect pathways ($R^2 = 0.12$). Additionally, the results indicated that the personality trait of openness has a 15% direct effect on mental health, and openness with the

mediation of social support has a 26% indirect effect on mental health among students. The findings further suggested that 3% of mental health can be explained by the variables of extraversion and social support in direct and indirect pathways ($R^2 = 0.03$).

Conclusion: The results indicated that the personality traits of neuroticism and openness have a significant direct effect on mental health; and that these traits, through the mediating role of social support, have an indirect effect on mental health.

Keywords: social support, personality traits, mental health, students, neuroticism, openness.

1. Introduction

The most fundamental issue in any country is the physical and mental health of its society. A person with physical health but without mental health will not be able to maintain balance in life. In other words, for living a healthy life and being useful in society, having optimal mental health is indispensable (Acoba, 2024; Sohrabi et al., 2019). The World Health Organization (WHO) defines health as a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity, emphasizing that having mental health is not limited to the absence of mental disorders (World Health Organization, 2001). It is a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, work productively and fruitfully, and is able to make a contribution to his or her community (Acoba, 2024; Behroozi et al., 2018; Hakulinen et al., 2016).

Many variables affect mental health, one of which is social support, which plays a positive and constructive role in promoting mental health (Dadvand et al., 2016). Social support is defined as the extent of love, companionship, and attention received from family members, friends, community resources, and other individuals. Some consider social support as a social reality, while others see it as a result of individual perception (the individual's belief in the presence of support criteria) (Barańczuk, 2019; Behroozi et al., 2018; Van Zyl et al., 2020). Social support includes the extent of love, companionship, care, respect, attention, and help received by an individual from people or groups such as family members, friends, and others, and is defined as very important (Zimet et al., 1988). Social support is one of the most effective ways for people to adapt to problems and cope with stressful issues (McKimmie et al., 2019). Hakulinen et al. (2016) found that higher levels of social support were associated with better health (Hakulinen et al., 2016). Similarly, Moezzodini et al. (2022) showed that the mediation model of health-promoting lifestyle behaviors had a favorable impact in the relationship between personality

traits and risky and problematic use of the internet (Moezzodini et al., 2022). Mazza et al. (2020) discovered that certain personality traits are significant risk factors for mental health problems during the COVID-19 quarantine (Mazza et al., 2020).

Therefore, greater understanding of the role of social support in personality traits and mental health among students can be practical for education practitioners, especially university professors and counselors. Given the lack of research on the mediating role of social support in personality traits and mental health among students, as well as the scarcity of studies in this area, research is essential. Factors influencing mental health, besides social support, include personality traits such as neuroticism and openness.

Personality is the unique and distinct patterns of thinking, emotion, and behavior that determine an individual's personal style of interacting with the physical and social environment. It is a set of characteristics that distinguish individuals from each other and affect their way of relating to others. Genetic diversity and cultural conditions create these differences. Personality influences how individuals cope with physical and mental threats, with different personality traits leading to different responses to problems (Tabatabaie et al., 2021). In fact, personality traits like openness and neuroticism are stable characteristics that do not change significantly from one situation to another and can predict behavior in various contexts (Pooreyed & Khormaei, 2019). The five-factor model is considered one of the most effective and comprehensive theories of personality, providing an almost holistic approach to explaining how people describe themselves and others (Allik et al., 2018). The five-factor model includes dimensions of agreeableness, neuroticism, extraversion, conscientiousness, and openness (flexibility and openness to new experiences). In this study, we examined the traits of openness and neuroticism.

Neuroticism or emotional instability is a long-term tendency towards negative emotional states or anxiety and is

not considered a disorder. Individuals with this trait are more prone to depression, guilt, jealousy, anger, irritability, envy, despair, loneliness, and anxiety. According to Piaget, a neurotic individual is unable to realize effective behaviors in the external world. Thus, the mutual influence of social support and mental health on neuroticism needs further investigation. According to Ai et al. (2019), openness is a prominent human trait characterized by curiosity about inner experiences and the surrounding world. Open individuals enjoy new experiences and have diverse thoughts compared to closed individuals. Openness is generally positively correlated with intelligence, with most educated individuals scoring higher on this trait. However, this does not imply that individuals with high openness are necessarily intelligent, as conservatism can lead to low scores in openness. Criteria for determining the level of openness in this study included high artistic and cultural literacy, creative talent, interest in new experiences, extensive social interaction, flexibility, and being multi-dimensional (Ai et al., 2019).

The main personality trait of openness, by fostering acceptance of new ideas and experiences, is important in students, promoting behavioral, mental, and practical stimulation. Therefore, examining the traits of neuroticism and openness and evaluating the impact of social support can help identify mental health components and improve the well-being of students. It is necessary to investigate the mutual effects of social support and mental health on neuroticism and openness. This study aimed to explore whether there is a relationship between neuroticism, openness, and mental health with the mediating role of social support.

2. Methods and Materials

2.1. Study Design and Participants

This study is fundamental in terms of purpose and employs a cross-sectional design for data collection and a descriptive approach for data analysis. It is a correlational study based on structural equation modeling. The statistical population consisted of all students at the Islamic Azad University, Sari branch, during the 2023-2024 academic year, totaling 5,400 individuals. Using Klein's method, 269 students were selected from the statistical population through systematic stratified non-random sampling. Initially, the research objectives and collaboration procedures were explained to the students in class, and after obtaining informed consent, the questionnaires were distributed among the sample group. Ethical considerations

were addressed by explaining the general goals of the research to the participants and assuring them of the confidentiality of their responses. The term "participant" was used instead of names in data analysis, and the right to withdraw from the study at any stage was emphasized.

2.2. Measures

2.2.1. General Health

The General Health Questionnaire (GHQ-28), developed by Goldberg and Hiller in 1972, comprises 28 items and four subscales: somatic symptoms, anxiety, social dysfunction, and depression, with each subscale containing 7 items. The scoring method is primarily Likert-based, with each item scored on a 4-point scale (0, 1, 2, 3), resulting in a total score range from 0 to 84, where higher scores indicate poorer health. Construct and content validity were confirmed by the developers, with Cronbach's alpha reliability ranging from 0.84 to 0.91. In Iran, validity and reliability were confirmed by Besharat (2007) and Taghavi (2001), with Cronbach's alpha coefficients for well-being and psychological distress in clinical and non-clinical samples ranging from 0.89 to 0.94, and reliability coefficients ranging from 0.85 to 0.91 (Besharat, 2009; Kazemi & Golpour Chamrakohi, 2022; Mirzaei et al., 2022).

2.2.2. Neuroticism and Openness

The NEO-FFI, developed by McCrae and Costa in 1985 and revised in 1992, comprises 60 items assessing five personality traits: neuroticism, extraversion, openness, agreeableness, and conscientiousness. Responses are based on a Likert scale (strongly disagree 0, disagree 1, neutral 2, agree 3, strongly agree 4). Construct and content validity were confirmed by the developers, with Cronbach's alpha reliability ranging from 0.79 to 0.88. In Iran, Grossi Farshi (2001) confirmed construct and content validity, with Cronbach's alpha reliability ranging from 0.56 to 0.87 (Costa Jr & McCrae, 1997; Kazemi & Golpour Chamrakohi, 2022; McCrae & Costa, 1985).

2.2.3. Perceived Social Support

This study used the 12-item Multidimensional Scale of Perceived Social Support (MSPSS) by Zimet et al. (1988), assessing support from family, friends, and significant others. Responses are based on a 7-point Likert scale ranging from strongly disagree to strongly agree, with total scores ranging from 12 to 60, where higher scores indicate greater

perceived social support. Construct and content validity were confirmed by the developers, with Cronbach's alpha reliability ranging from 0.82 to 0.92. In a study by Karami et al. (2017), Cronbach's alpha for middle-aged and elderly participants was 0.80, confirming validity and reliability. Additionally, Salimi, Jokar, and Nikpour (2009) reported Cronbach's alpha coefficients of 0.89, 0.86, and 0.82 for family, friends, and significant others, respectively. The psychometric properties of the MSPSS have been confirmed in international studies (Acoba, 2024; Barańczuk, 2019; Bruwer et al., 2008; Dadvand et al., 2016; Hatamian et al., 2018; Karami et al., 2017; Kayed & Kazemian Moghadam, 2021; McKimmie et al., 2019; Mirzaei et al., 2022; Poorseyed & Khormaei, 2019; Sayadpour et al., 2021; Sohrabi, 2019; Zimet et al., 1988).

2.3. *Data analysis*

For data analysis, descriptive statistics (mean and standard deviation) and inferential statistics (structural equation modeling) were used with SPSS 18 and Amos 23 software.

3. **Findings and Results**

The sample group consisted of 269 students, with a nearly equal distribution of age groups: 49.8% were aged 20 to 35 years (n = 134) and 50.2% were aged 36 and above (n = 135). In terms of educational status, 46.8% were pursuing a bachelor's degree (n = 126), while 53.2% were in graduate programs (n = 143). The gender distribution was predominantly female, with 78% women (n = 210) and 22% men (n = 59).

Table 1

Descriptive Statistics for Study Variables

Variable	Mean (M)	Standard Deviation (SD)
Neuroticism	24.36	5.87
Openness	28.47	4.92
Social Support	45.32	6.21
Mental Health (GHQ-28 Total)	32.15	8.45
Somatic Symptoms	7.82	2.31
Anxiety	8.47	2.84
Social Dysfunction	8.25	2.56
Depression	7.61	2.74

Initially, the normality of the data was confirmed using statistical tests such as skewness, kurtosis, and the

Kolmogorov-Smirnov test, as the scale of the instrument is interval-based.

Table 2

Fit Indices from Data Analysis and Variables

Test Name	Acceptable Values	Obtained Value
χ^2/df	< 3	2.657
RMSEA	< 0.10	0.037
GFI	> 0.90	0.999
NFI	> 0.90	0.999
CFI	> 0.90	0.999

The RMSEA value is 0.037, which is less than 0.10, indicating that the mean square error of the model is suitable and the model is acceptable. Additionally, the χ^2/df value is 2.657, which is between 1 and 3, and the GFI, CFI, and NFI

indices are all approximately equal to or greater than 0.90, demonstrating that the measurement model for the research variables is appropriate.

Table 3

Direct Estimates of the Model Using Maximum Likelihood (ML) Method

Variable	B	β	R ²	T	P
Neuroticism on Mental Health	0.387	0.312	0.120	4.435	0.01
Openness on Mental Health	-0.213	-0.153	0.032	-3.098	0.01

According to [Table 3](#), the direct estimates of the model using the maximum likelihood method show the paths from

the personality traits of neuroticism and openness and social support to mental health.

Table 4

Indirect Estimates of the Model Using Bootstrap Method

Variable	β	Lower Bound	Upper Bound	Significance
Neuroticism with Mediating Social Support on Mental Health	0.376	0.441	0.312	0.01
Openness with Mediating Social Support on Mental Health	-0.265	-0.314	-0.198	0.01

According to [Table 4](#), the indirect paths of personality traits on mental health with the mediation of social support can be observed. Based on the obtained statistics from the three main indices (absolute, comparative, and parsimonious), the research model is confirmed. Overall, personality traits can predict 59% ($R^2 = 0.59$) of the variance in mental health through direct and indirect paths. Specifically, the traits of neuroticism and openness are examined in the following charts ($R^2 = 0.03$, $R^2 = 0.12$).

4. Discussion and Conclusion

This study examined the mediating role of social support in the relationship between the personality traits of neuroticism and openness with mental health among students. The results indicated that the personality traits of neuroticism and openness have a significant direct effect on mental health; and that these traits, through the mediating role of social support, have an indirect effect on mental health. The research model was confirmed. These results are consistent with the prior findings ([Abdelrahman, 2022](#); [Kayed & Kazemian Moghadam, 2021](#); [Kazemi & Golpour Chamrakohi, 2022](#); [Mamsharifi et al., 2020](#); [Mazza et al., 2020](#); [Moezzodini et al., 2022](#); [Regzedmaa et al., 2024](#); [Sohrabi et al., 2019](#)). The consistency in the results can be attributed to common cognitive indicators in mental health, as cognitive and spiritual foundations are considered important factors in the manifestation of shared mental health symptoms. Therefore, despite differences in tools and temporal and spatial conditions in previous studies compared to the present study, the consistency found can be confirmed based on cognitive and spiritual foundations in the studied variables.

In explaining the above findings, it can be said that one of the individual factors affecting mental health is the personality trait of neuroticism and openness ([Abdelrahman, 2022](#)). [Kazemi and Golpour \(2022\)](#) showed that individuals scoring high on neuroticism are more vulnerable to stressful events, being prone to various psychiatric disorders such as anxiety and depression under stressful conditions. In normal conditions, these individuals experience mild and subthreshold anxiety that might not significantly interfere with their daily functions, but under stress, they tend to overestimate risks and anticipate the worst outcomes. Fear and uncertainty are other characteristics of these individuals, manifesting as excessive anxiety and worry in severe cases ([Kazemi & Golpour Chamrakohi, 2022](#)). [Regzedmaa's \(2024\)](#) findings are consistent with our results, showing a significant positive relationship between neuroticism, anxiety, and performance. Neurotic individuals perceive negative emotions, reducing the range of immediate thoughts and actions, limiting their cognitive and behavioral responses ([Regzedmaa et al., 2024](#)). According to the hypothesis of thought-action repertoire constriction, it is impossible to simultaneously limit and expand thought-action repertoires. Therefore, continuous negative emotions might reduce the intensity of positive emotions, leading to poor social health. According to [Fredrickson's \(2003\)](#) view, positive emotions expand immediate thought-action repertoires, resulting in a broader range of thoughts and actions pursued by the individual, consistent with our finding of interest in new experiences in the openness trait ([Fredrickson, 2003](#)).

[Costa and McCrae \(1997\)](#) believe that personality traits influence behavior, cognition, and emotions, aligning our

findings with their theory (Costa Jr & McCrae, 1997). When individuals lack appropriate social and family support, they might experience cognitive distortions, feeling unloved and unimportant, leading to feelings of worthlessness and depression (Mirderkvand et al., 2017). Therefore, social support significantly impacts fulfilling an individual's basic psychological needs, influencing mental health. According to self-determination theory, social support not only fulfills basic psychological needs but also guides individuals' needs according to social norms, impacting mental health. Additionally, part of an individual's mental health is familial; when family mental health declines, members experience high stress, adopting ineffective coping strategies and seeking social support, potentially harming mental health (Nabavi et al., 2014). From a social and behavioral perspective, friends and peers are major factors in promoting mental health (Hatamian et al., 2018). Individuals high in openness enhance social skills, increasing social activity and interactions, establishing close relationships, and improving adaptability to psychological and non-psychological factors, raising perceived social support among students. Mirzaei et al. (2022) found that social support and mental health significantly predict marital dissatisfaction, generalizable to students' daily lives, indicating the need to expand these components for students' mental well-being (Mirzaei et al., 2022). Sohrabi (2022) showed that individual and social support variables impact quality of life (Sohrabi, 2019). Naderifar (2024) found that openness and emotional stimulation directly and neuroticism indirectly contribute to harmful behaviors like addiction, with social support reducing these tendencies (Naderifar et al., 2024). Van Zyl (2020) showed that psychosocial interventions post-bariatric surgery enhance physical and psychological well-being and maintain weight loss better than initial interventions, highlighting the importance of recognizing supportive measures in the educational context (Van Zyl et al., 2020).

5. Limitations & Suggestions

Limitations of this study include reliance on questionnaires and the absence of other tools, which may partially explain the variance. Future research should focus on other individual and social factors and variables. Additionally, using interviews in similar studies and involving diverse age groups and locations will increase generalizability. Self-report questionnaires pose another limitation, allowing for potentially false responses. Random and accessible sampling from each faculty might impact

external validity or generalizability. This study was limited to Sari University students; further research across other universities in the country is needed. It is recommended that counselors and psychologists emphasize cognitive factors like personality traits and family and friend support to improve mental health during students' educational processes, as changes in personality traits can impact students' life quality and mental health.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contributed in this article.

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